

REMARKS

The Office Action dated May 29, 2003, has been received and reviewed.

Claims 1-21 are currently pending in the above-referenced application. Of these, claims 1-15 stand rejected. Claims 16-21 have been withdrawn from consideration. Claims 16-21 have been canceled without prejudice or disclaimer.

Reconsideration of the above-referenced application is respectfully requested.

Obviousness-Type Double Patenting Rejection

Claims 1-15 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of U.S. Patent 6,471,780. A terminal disclaimer and the appropriate fee are being filed herewith, in compliance with 37 C.F.R. § 1.321(b) and (c), to obviate the obviousness-type double patenting rejection, thereby expediting prosecution of the above-referenced application and avoiding further expense and time delay. The filing of a terminal disclaimer in the above-referenced application should not be construed as acquiescence of the obviousness-type double patenting rejection.

Rejections Under 35 U.S.C. § 102

Each of claims 1-15 stands rejected under 35 U.S.C. § 102.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Additionally, the elements must be arranged as required by the claim, but identity of the terminology is not required. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Moslehi

Claims 1-11, 14, and 15 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated by the disclosure of U.S. Patent 5,436,172 to Moslehi (hereinafter "Moslehi").

Moslehi describes a system for maintaining temperature uniformity and process uniformity within a process chamber in real-time. The system of Moslehi includes, among other things, a process chamber, a heater within the process chamber, and temperature sensors that transmit signals in response to sensed temperatures. While the system of Moslehi includes a process control computer 150 that communicates with the heater (a lamp module 130) (col. 9, lines 19-50), the disclosure of Moslehi with respect to the process control computer 150 is limited to stabilizing a temperature within the reaction chamber and across a wafer (col. 3, line 65, to col. 4, line 2; col. 15, lines 6-11 and 39-43; col. 15, line 59, to col. 16, line 2).

Independent claim 1, as amended and presented herein, in contrast, recites a semiconductor processing assembly which includes, among other things, a temperature regulator which is "configured to vary a thermal output of [a] heater and a temperature of at least a portion of . . . at least one semiconductor substrate responsive to [a] signal" from at least one temperature sensor.

As Moslehi does not expressly or inherently describe that the process control computer 150 thereof is configured to vary a thermal output of a heater but, rather, to maintain a thermal output of a heater (lamp module 130) and to maintain a temperature of a substrate, it is respectfully submitted that Moslehi does not anticipate each and every element of amended independent claim 1.

It is, therefore, respectfully submitted that, under 35 U.S.C. § 102, independent claim 1 is allowable over the subject matter described in Moslehi.

Each of claims 2-11 is allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Claim 5 is additionally allowable because Moslehi neither expressly nor inherently describes that the process control computer 150 thereof is "configured to vary [a] thermal output of [a] heater over a span of time."

Independent claim 14, as amended and presented herein, is drawn to a supplement to a fabrication chamber. The supplement of independent claim 14 includes a variable substrate temperature generation system that includes a feedback control system that is "configured to cause [a] heating element of [the] fabrication chamber to alter a thermal output within [the] fabrication chamber and a temperature of at least a portion of [a] substrate in response to transmission of a signal from . . . at least one temperature sensor."

Again, as the disclosure of Moslehi is limited to a process control computer 150 that is configured to stabilize a temperature of a substrate (*e.g.*, a semiconductor wafer), it is respectfully submitted that Moslehi does not expressly or inherently describe or anticipate a feedback control system that is configured to cause a heating element of a fabrication chamber to alter a thermal output in response to a signal from one or more temperature sensors.

It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), amended independent claim 14 is allowable over the subject matter described in Moslehi.

Claim 15 is allowable, among other reasons, as depending from claim 14, which is allowable.

Brors

Claims 1-3, 5-8, and 10-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,551,985 to Brors et al. (hereinafter "Brors").

Brors describes a chemical vapor deposition (CVD) reactor that includes a pair of thermal plates and a corresponding pair of temperature sensors. Col. 2, lines 47-51; col. 3, lines 6-24. In using the CVD reactor, a substrate (*e.g.*, a semiconductor wafer) is positioned between the thermal plates. Col. 2, lines 54-56. A first of the temperature sensors, which is embedded within a corresponding first thermal plate, provides a temperature signal to a computer which maintains the temperature of the first thermal plate. Col. 3, lines 6-14. The other, second temperature sensor likewise transmits temperature signals to a computer which, in turn, maintains the thermal plate (a thermal ring plate) that corresponds to the second temperature sensor at a constant temperature. Col. 3, lines 15-24.

Like Moslehi, Brors lacks any express or inherent description that the computer which controls the temperatures of the thermal plates and the substrates thereon may be "configured to vary a thermal output of [a] heater and a temperature of at least a portion of . . . at least one semiconductor substrate responsive to [a] signal" from at least one temperature sensor.

Therefore, Brors does not anticipate each and every element of amended independent claim 1. Accordingly, under 35 U.S.C. § 102(b), amended independent claim 1 recites subject matter which is allowable over that disclosed in Brors.

Claims 2, 3, 5-8, and 10-13 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 5 is further allowable since Brors includes no express or inherent description that the computer thereof is "configured to vary [a] thermal output of [a] heater over a span of time."

Amended independent claim 14 is allowable over Brors under 35 U.S.C. § 102(b) since Brors lacks any express or inherent description of a variable substrate temperature generation system that includes a feedback control system that is "configured to cause [a] heating element of [the] fabrication chamber to alter a thermal output within [the] fabrication chamber and a temperature of at least a portion of [a] substrate in response to transmission of a signal from . . . at least one temperature sensor." Instead, the description of Brors is limited to a system which includes first and second temperatures sensors and a computer that, in response to signals received from the temperature sensors, adjusts the power provided to heating lamps in a way that maintains temperatures of thermal plates that correspond to the temperature sensors.

Claim 15 is allowable, among other reasons, for depending from claim 14, which is allowable.

Johnsgard

Claims 1-8 and 10-15 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 5,830,277 to Johnsgard et al. (hereinafter "Johnsgard").

Johnsgard teaches a rapid thermal processing (RTP) system that includes optical sensors that are used to measure temperature and an element which receives signals from the optical sensors and causes a heater to uniformly heat a substrate. Col. 6, lines 42-53.

With respect to the elements recited in independent claim 1, because the description of Johnsgard is limited to uniformly heating a substrate, Johnsgard lacks any express or inherent description of temperature regulator which is "configured to vary a thermal output of [a] heater and a temperature of at least a portion of . . . at least one semiconductor substrate responsive to [a] signal" from at least one temperature sensor.

Therefore, Johnsgard does not anticipate each and every element of amended independent claim 1 under 35 U.S.C. § 102(e). Thus, under 35 U.S.C. § 102(e), amended independent claim 1 is allowable over Johnsgard.

Each of claims 2-8 and 10-13 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 5 is also allowable since Johnsgard neither expressly nor inherently describes an element that is "configured to vary [a] thermal output of [a] heater over a span of time."

Turning to the subject matter recited in amended independent claim 14, Johnsgard lacks any express or inherent description of a feedback control system that is "configured to cause [a] heating element of [the] fabrication chamber to alter a thermal output within [the] fabrication chamber and a temperature of at least a portion of [a] substrate in response to transmission of a signal from . . . at least one temperature sensor." Rather, like Moslehi and Brors, the description of Johnsgard is limited to a system in which a heater is adjusted to maintain the temperature of a substrate at a constant level.

It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(e), the subject matter recited in amended independent claim 14 is novel and, thus, allowable over the subject matter disclosed in Johnsgard.

Claim 15 is allowable, among other reasons, for depending from claim 15, which is allowable.

Yieh

Claims 1-3, 5-11, 14, and 15 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,352,591 to Yieh et al. (hereinafter "Yieh").

Yieh also describes high-temperature processing systems that are configured to maintain a current temperature. Col. 20, lines 23-24, 31-35, 35-38.

Again, amended independent claim 1 recites a semiconductor processing assembly which includes, among other things, a temperature regulator which is "configured to vary a thermal output of [a] heater and a temperature of at least a portion of . . . at least one semiconductor substrate responsive to [a] signal" from at least one temperature sensor.

As Yieh does not expressly or inherently describe a temperature regulator which is configured to vary a thermal output of a heater and a temperature of at least a portion of at least one semiconductor substrate, it is respectfully submitted that Yieh does not anticipate each and every element of amended independent claim 1. It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(e), amended independent claim 1 is allowable over the disclosure of Yieh.

Claims 2, 3, and 5-11 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 5 is additionally allowable since Yieh lacks any express or inherent description of an element that is "configured to vary [a] thermal output of [a] heater over a span of time."

Amended independent claim 14 recites a feedback control system that is "configured to cause [a] heating element of [the] fabrication chamber to alter a thermal output within [the] fabrication chamber and a temperature of at least a portion of [a] substrate in response to transmission of a signal from . . . at least one temperature sensor," an element which is neither expressly nor inherently described in Yieh. Instead, the description of Yieh is limited to a feedback control system that is configured to maintain a current temperature.

Therefore, it is respectfully submitted that, under 35 U.S.C. § 102(e), amended independent claim 14 is allowable over the subject matter described in Yieh.

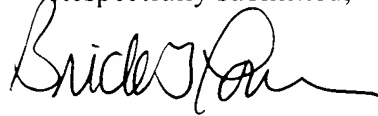
Claim 15 is allowable, among other reasons, for depending either directly or indirectly from claim 14, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 102 rejections of claims 1-15 be withdrawn.

CONCLUSION

It is respectfully submitted that each of claims 1-15 is allowable. An early notice of the allowability of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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